DOCUMENT RESUME

ED 402 127 RC 020 792

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TITLE Aspirations of Students Attending a Science and Mathematics Residential Magnet School.
PUB DATE Oct 96
NOTE 8p.; Paper presented at the Annual Meeting of the National Rural Education Association (San Antonio, TX, October 1996).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Aspiration; Educational Environment; *Gifted; High Schools; *High School Students; Life Satisfaction; *Magnet Schools; School Attitudes; Self Concept; *Student Attitudes; Student Motivation
IDENTIFIERS Maine

ABSTRACT

A survey examined educational aspirations and perceptions of school climate among gifted students at the Maine School of Science and Mathematics, a state-funded rural magnet school serving grades 11 and 12. Students at the magnet school completed the 84-item Grades 6-12 Aspirations Survey, returning 97 usable forms. The instrument has 12 scales: 2 measure student aspirations, 8 measure student perceptions of school climate, and 2 estimate student enjoyment of life and achievement motivation. Results were compared to an archive of survey data from 260 11th- and 12th-grade students of general ability. Compared to the archive data, magnet school students reported higher levels of aspirations, achievement motivation, general enjoyment of life, and perceptions of school climate conditions. Findings suggest that high-ability secondary students attending magnet schools have high aspirations, higher than those of students in a general-ability sample. In addition, magnet school students appear to perceive a school climate that is supportive and fosters achievement and aspirations to a greater extent than do general-ability students attending traditional high schools. Contains 20 references. (SV)

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Aspirations of Students Attending a Science and Mathematics Residential Magnet School

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RC020792

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Aspirations of Students Attending a Science and Mathematics Residential Magnet School

Two major biases face talented students as they progress through the educational system. In the first, they are assumed to differ only intellectually from their less talented peers (i.e., they do not differ in nonacademic self-concept, aspirations, and other social and emotional areas of emotional development). In the second, gifted and talented individuals are assumed to have "super powers" as they work their way through school and prepare for future careers (Fredrickson, 1986; Plucker & McIntire, 1996). Fortunately, educators are beginning to appreciate the role that affect plays in the development of academic talent (Cross, Coleman, & Stewart, 1993; Hoge & Renzulli, 1993; Manor-Bullock, Look, & Dixon, 1995).

However, the study of high ability students' aspirations is underdeveloped, which is surprising given the link between aspirations and leadership skills (McCullough, Ashbridge, & Pegg, 1994; Robinson & Horne, 1993), attrition in high school (Bickel, 1989; Bickel & Lange, 1995; Eckstrom, Goertz, Pollack, & Rock, 1986) and college (Foster, 1975), and educational and career attainment (Flint, 1992; Long, 1995; Robertshaw & Wolfle, 1980). Previous investigations of gifted students' aspirations generally lack a strong theoretical base and, as a result, measure aspirations at a simplistic level. For example, several studies measure aspirations with a single question, such as, "What level of education do you plan to attain?" The results of these exploratory studies suggest that students who participate in enrichment programs in elementary grades have moderate to high educational, career, and personal aspirations as they enter college (Moon & Feldhusen, 1993); mentoring programs at the secondary level may have a positive impact upon aspirations of gifted students (Leroux, 1992); gifted boys and girls differ in their specific career and educational aspirations, but both girls and boys have high general aspirations (Feldhusen & Willard-Holt, 1993; Leung, Conoley, & Scheel, 1994). No studies were found in which the aspirations of gifted and talented students were compared to those of a general ability population of students.

The purposes of this study were to measure the aspirations and school climate perceptions of gifted students attending a residential magnet school of science and mathematics and compare their aspirations and climate perceptions to those of a general ability sample of students.

Method

The Grades 6-12 Aspirations Survey was administered to students attending the Maine School of Science and Mathematics (MSSM) in early spring during the school's first year of operation. MSSM is a state-funded magnet school serving students in the 11th and 12th grades. Approximately 100 students returned surveys, with a final sample size of 97 after accounting for surveys that were returned nearly incomplete. For comparison purposes, a sample of general ability students scores was drawn from the data archive of the National Center for Student Aspirations (NCSA) at the University of Maine. The archive contained survey results for 260 11th and 12th grade students.

The 84-item Grades 6-12 Aspirations Survey was administered by classroom teachers. Previous psychometric research with the instrument found moderate evidence of reliability and validity when used with students in grades 8 through 12 (Plucker, 1996; Plucker & Quaglia, 1996). The instrument has 12 scales: two scales that provide measures of student aspirations (inspiration and ambition), eight scales which measure student perceptions of school climate conditions, and two scales which provide estimates of students' enjoyment of life and achievement motivation. Researchers at the NCSA identified eight conditions which support the development of high levels of inspiration and ambitions in students (University of Maine, 1994): achievement, belonging, curiosity, empowerment, excitement, mentoring, risk-taking, and self-confidence. When responding to items which constituted the scales, students responded from strongly agree (1) to strongly disagree (4), and scales scores were converted to this metric for interpretation purposes.

Results

Results of the analyses are included in Table 1. Magnet school students reported high levels of ambition, achievement motivation, and general enjoyment of life, and held favorable perceptions of all eight climate conditions. When compared to the general ability sample, magnet school students had higher levels of aspirations, achievement motivation, general enjoyment of life, and perceptions of school climate conditions. In all cases, uncorrected effect size estimates were moderate to large in magnitude. A multivariate analysis of variance with group membership as the independent variable and students scores on the four aspirations and self-description scales (i.e., ambition, inspiration, general enjoyment of life, and achievement motivation) as dependent variables produced evidence of statistically and practically significant differentiation between the two groups (Wilks' Λ=.89, F[4,285]=8.47, p<.001, canonical correlation=.33). Similar results were obtained when scores on the eight climate perception scales were analyzed as the dependent variables (Wilks' Λ=.82, F[8, 217]=5.82, p<.001, canonical correlation=.42).

Discussion

Several cautions must be made before the results are discussed. First, the study was causal-comparative and not experimental in nature, so the impact of the magnet school on student aspirations cannot be determined from this data. The 12th grade students who attended the magnet school at the time of this study can presently be found at the campuses of the country's leading universities and colleges, and this study does not produce evidence that they would not have done so if they had not attended the magnet school. Second, comparisons between magnet school and non-magnet school students may underestimate any differences in aspirations and climate perceptions related to ability. While the magnet school sample is characterized by high levels of talent, the general ability sample also contains students of high ability. Were the gifted students removed from the non-magnet school sample, differences between the two groups may have been even larger.

However, any negative impact upon gifted students aspirations by the magnet school would be easier to detect, regardless of the non-experimental nature of the study. Student scores representing aspirations and climate perceptions were relatively high on almost every scale, and as stated above, the students have subsequently matriculated at an impressive selection of universities. The research provides evidence that high ability secondary students attending magnet schools have high aspirations, and that these aspirations are higher than those of students in a general ability sample. In addition, magnet school students appear to perceive a school climate that is supportive and fosters both achievement and aspirations to a greater extent than students in a general ability sample attending traditional high schools.

Analysis of gender differences, exploration of subject specific aspirations, and longitudinal and experimental research are needed to build upon the exploratory work that has recently been conducted on the aspirations of gifted and talented students. As this population is frequently served by magnet schools, especially those focusing on mathematics, science, and technology, research in this area will provide critical information for administrators and faculty as they attempt to develop and foster academic, intellectual, and affective aspects of talented students' lives.

References

Bickel, R. (1989). Post-high school opportunities and high school completion rates in an Appalachian state: A near-replication of Florida research. Youth & Society, 21, 61-84.

Bickel, R., & Lange, L. (1995). Opportunities, costs, and high school completion in West Virginia: A replication of Florida research. The Journal of Educational Research, 88, 363-370.

Coleman, L. J., & Cross, T. L. (1988). Is being gifted a social handicap? Journal for the Education of the Gifted, 11, 41-56.

Eckstrom, R. B., Goertz, M. E., Pollack, J. M., & Rock, D. A. (1986). Who drops out of high school and why? Findings from a national study. Teachers College Record, 87, 356-373.

Feldhusen, J. F., & Willard-Holt, C. (1993). Gender differences in classroom interactions and career aspirations of gifted students. Contemporary Educational Psychology, 18, 355-362.

Flint, T. A. (1992). Parental and planning influences on the formation of student college choice sets. Research in Higher Education, 33, 689-708.

Foster, R. J. (1975, June). Differences between persistors and nonpersistors in engineering programs. Paper presented at the meeting of the American Society for Engineering Education, Fort Collins, CO. (ERIC Document Reproduction Service No. ED 125 875)

Fredrickson, R. H. (1986). Preparing gifted and talented students for the world of work. Journal of Counseling and Development, 64, 556-557.

Hoge, R. D., & Renzulli, J. S. (1993). Exploring the link between giftedness and self-concept. Review of Educational Research, 63, 449-465.

Leroux, J. A. (1992). Stretching the limits of learning: Mentorships for gifted high school students. The Vocational Aspect of Education, 44, 249-258.

Leung, S. A., Conoley, C. W., & Scheel, M. J. (1994). The career and educational aspirations of gifted high school students: A retrospective study. Journal of Counseling and Development, 72, 298-303.

Long, J. E. (1995). The effects of tastes and motivation on individual income. Industrial and Labor Relations Review, 48, 338-351.

Manor-Bullock, R., Look, C., & Dixon, D. N. (1995). Is giftedness socially stigmatizing? The impact of high achievement on social interactions. Journal for the Education of the Gifted, 18, 319-338.

McCullough, P. M., Ashbridge, D., & Pegg, R. (1994). The effect of self-esteem, family structure, locus of control, and career goals on adolescent leadership behavior. Adolescence, 29(115), 605-611.

Moon, S. M., & Feldhusen, J. F. (1993). Accomplishments and future plans of high school seniors who participated in an elementary enrichment program. Roeper Review, 15, 176-178.

Plucker, J. A. (1996). From where does hope spring? The relationship between school climate conditions and student aspirations. Manuscript submitted for publication.

Plucker, J. A., & McIntire, J. (1996). Academic survivability in high-potential, middle school students. Gifted Child Quarterly, 40, 7-14.

Plucker, J. A., & Quaglia, R. J. (1996). The Student Aspirations Survey: Assessing student effort and goals. Manuscript submitted for publication.

Robertshaw, D., & Wolfle, L. M. (1980, April). Discontinuities in schooling and educational attainment. Paper presented at the meeting of the American Educational Research Association, Boston. (ERIC Document Reproduction Service No. ED 186 488)

Robinson, J. P., & Horne, H. R., Jr. (1993). Relationship between perceived leadership ability and aspiration levels of high school students. (ERIC Document Reproduction Service No. ED 365 785)

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Aspirations and Perceptions of School Climate in Grade 11 and 12 Students

	General Ability Students				Gifted and Talented Students					
Scale	**Mean**	**SE Mean**	**SD**	**n**	**Mean**	**SE Mean**	**SD**	**n**	***diff***	***g***
Aspirations										
Inspiration	2.67	0.03	0.49	254	2.37	0.04	0.42	92	*0.30*	***0.66***
Ambition	1.78	0.03	0.51	254	1.51	0.05	0.49	92	*0.27*	***0.54***
Self-perceptions										
Ach. motivation	1.96	0.03	0.46	251	1.67	0.06	0.46	68	*0.29*	***0.63***
Gen. enjoyment	2.38	0.03	0.51	250	2.17	0.05	0.45	77	*0.21*	***0.44***
Conditions										
Achievement	2.15	0.03	0.42	235	1.96	0.04	0.41	92	*0.19*	***0.46***
Belonging	2.21	0.03	0.43	230	2.01	0.05	0.50	91	*0.20*	***0.43***
Curiosity	2.13	0.03	0.42	225	1.83	0.05	0.43	91	*0.30*	***0.71***
Empowerment	2.35	0.03	0.53	252	2.10	0.05	0.51	92	*0.25*	***0.48***
Excitement	2.45	0.03	0.50	230	2.10	0.05	0.49	90	*0.35*	***0.71***
Mentoring	2.23	0.03	0.49	230	2.01	0.06	0.55	93	*0.22*	***0.42***
Risk-taking	2.18	0.03	0.43	214	1.91	0.05	0.45	94	*0.27*	***0.61***
Self-confidence	2.11	0.03	0.41	211	1.82	0.05	0.46	93	*0.29*	***0.67***

Note1. Data for general ability students drawn from NCSA archive.
Gifted and talented students attended a residential magnet school for mathematics and science.
Note2. g=uncorrected effect size estimate, calculated by dividing mean difference between groups by pooled :